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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,399	12/03/2003	David Forehand	MEM 2657001	5565
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CARR LLP 670 FOUNDERS SQUARE 900 JACKSON STREET DALLAS, TX 75202			EXAMINER MITCHELL, JAMES M	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/726,399	Applicant(s) FOREHAND, DAVID	
	Examiner JAMES M. MITCHELL	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 24, 26-33, 44, 46-53, 64, 66, 68-70 and 72-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 24, 26-33, 44, 46-53, 64, 66, 68-70 and 72-80 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to applicant's amendment filed January 10, 2008. The indicated allowability of claims 1-12, 25-33, 45-53, 68, 71 and 72 are withdrawn in view of further newly discovered Carley (U.S. 7,008,812). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 70, 72, 73 and 75-80 are rejected under 35 U.S.C. 102(e) as being anticipated by Carley (U.S. 7,008,812).

4. Carley (Fig. 8B; 9B) discloses:

(cl. 70, 80) A method for packaging a device, the method comprising: forming a housing (18) over the device, the housing having at least one aperture (e.g. 20); forming the shape and size of the aperture, such that a removing material is able to pass through the aperture (Fig. 6B→7B) but a protective material cannot pass through the aperture (Fig. 9B), and removing a sacrificial material (e.g. 12, 16) from within the housing through the at least one aperture (Fig. 9B);

(c. 72) wherein removing a sacrificial material comprises at least one selected from the

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list consisting of: sputter etching, ion beam milling, chemical etching, plasma ashing, and plasma etching (Abstract);

(cl. 73, 78) depositing the protective material (26) adjacent to the housing;

(cl. 75, 76) depositing a layer of structural material (18) about the device, wherein the structural material has a lower etch rate than the sacrificial material of at least one selected from the list consisting of: a photoresist and a polyimide material (Col. 2, Lines 42-54).

(cl. 77) depositing a layer of conductive material (Col 4, Lines 44-45 & Col. 5, Lines 27-30).

(cl. 79) a surface tension of the covering material prevents the covering material from passing through the one or more apertures (e.g. 26, not passing through holes; Fig. 9B).

(cont cl. 80) a removing material, having a first viscosity, is able to pass through the aperture (Fig. 6B→7B) but a protective material cannot pass through the aperture and therefore having a second viscosity, (Fig. 9B).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 74 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carley (U.S. 7,008,812) in combination with Marrs (U.S. 5,485,037) and Plummer et al. (U.S. 4,480,975).

7. Carley discloses the elements of paragraph 4 of this office action, but does not explicitly disclose the material is cured/ allowed to harden or use of gas pressure that's at least 1Pascal and a temperature less than 600 degree or depositing protective material by allowing the protective material to flow into at least a portion of an aperture

8. However, Marrs discloses curing an electrically nonconductive sealing material (e.g. plastic "transfer molding"; Col. 5, Lines 50-52) while Plummer (Col. 3, Lines 3-40) teaches that transfer molding uses a gas pressure ranges of at least 1Pascal and a temperature less than 600 degree allowing a material to flow into at least a portion of an aperture/cavity.

9. It would have been obvious to one of ordinary skill in the art to incorporate curing an electrically nonconductive material on the housing of Carley at the claimed ranges in order to package the device by transfer molding as taught by Marrs (Col. 5, Lines 49-51).

10. Furthermore with respect to the claimed range, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed temperature and curing ranges, since it has been held that where the general working conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955).

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11. Claims 1, 2-5, 8-12, 24-28, 31-33, 44-48, 51-53, 64 and 66 and 68 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carley (U.S. 7,008,812) in combination with Marrs (U.S. 5,485,037) and Plummer et al. (U.S. 4,480,975).

12. Carley (e.g. Fig. 7C, 8B, 9B) discloses:
(cl. 1, 45, 68) a method for packaging at least one microscopic device, comprising:
applying a sacrificial material (12, 16) to at least one microscopic device (14); applying a layer of structural material (18) adjacent the sacrificial material, the layer of structural material forming a housing adjacent at least a portion of the sacrificial material; creating one or more apertures (20) in the housing of structural material to expose at least a portion of the adjacent sacrificial material, the apertures having and thus determining size and shape such that a removing material is able to pass through at least one of the apertures but a protective material cannot pass through (26 not passing through holed; e.g. Fig. 9B); removing the sacrificial layer (Col. 4, Line 50), wherein the housing of structural material with at least one aperture remains (Fig. 7C); depositing a protective material (26a-c) adjacent the housing of structural material overlaying at least one aperture of the housing in amount sufficient to substantially close the aperture without entering the housing sufficiently to interfere with operation of the device; and curing the protective material (Par. 0049);
(cl. 3, 4, 46, 47) wherein etch rate ¹ is higher than structural material composed of a photoresist or polyimide (Col. 2, Lines 42-54);

¹ Same structural and sacrificial material as claimed.

(cl. 5, 48) wherein the structural layer is selected from a group of Silicon Dioxide (SiO₂) and Silicon Nitride (Si₃N₄) (Col. 4, Lines 28-29);

(cl. 8, cont. cl. 25, 45, 51) and removing the sacrificial layer comprises use of either plasma ashing or plasma etching (Abstract)

(cl. 66, 69) and protective material extends² at least into one aperture ("seals port [holes]"; Col. 5, Lines 20-23).

13. Carley discloses that its sealing material may be electrically nonconductive (Col. 5, Lines 24-25) and at least a portion of the surface of the housing with no material in a moveable region (e.g. sacrificial material moves), but does not explicitly disclose the material is cured/ allowed to harden or use of gas pressure that's at least 1Pascal and a temperature less than 600 degree or depositing protective material by allowing the protective material to flow into at least a portion of an aperture

14. However, Marrs discloses curing an electrically nonconductive sealing material (e.g. plastic "transfer molding"; Col. 5, Lines 50-52) while Plummer (Col. 3, Lines 3-40) teaches that transfer molding uses a gas pressure ranges of at least 1Pascal and a temperature less than 600 degree allowing a material to flow into at least a portion of an aperture/cavity.

15. It would have been obvious to one of ordinary skill in the art to incorporate curing an electrically nonconductive material on the housing of Carley at the claimed ranges in order to package the device by transfer molding as taught by Marrs (Col. 5, Lines 49-51).

16. Furthermore with respect to the claimed range, it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed temperature and curing ranges, since it has been held that where the general working conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955).

17. With respect to the selected thickness of claims 11, 12, 32, 33, 52 and 53 like the sacrificial or structural layer thickness is between .2 and about 10 microns.

18. Applicant has not disclosed that the claimed thickness is for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. Hence the limitation would have been obvious, since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

19. Claims 6, 7, 29, 30, 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carley et al. (U.S. 7,008,812), Marrs (U.S. 5,485,037) and Plummer et al. (U.S. 4,480,975) as applied to claim 2 and 25 and further in combination with Yang et al. (U.S. 2004/0046835).

² Note even a layer that extends horizontally over a hole/aperture would extend into the hole region (i.e.

20. Neither Carley, Marrs nor Plummer appears to disclose the step of removing by sputter etching or ion beam milling or chemical etching.

21. However Carley discloses the same invention except that removal is through plasma etch instead of through sputter, ion beam milling or chemical etching.

22. Yang shows that plasma, sputter etching or ion beam milling or chemical etching is equivalent processes that form equivalent structures known in the art known.

Therefore, because these processes are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the use of for example a chemical etch instead of a plasma etch to remove material.

Response to Arguments

23. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art discloses in: Daidai et al. (U.S. 5,593,721) the use of curing nonconductive material to provide a package and Chaung (U.S. 2005/0110168) a curing step as part of a transfer molding process; Tung et al. (U.S. 5,254,501) and Eickman et al. (U.S. 4,719,250) the injection pressure in a mold being at least 1 Pascal to allow sealing material to flow in the mold to package component.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES M. MITCHELL whose telephone number is (571)272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Carl Whitehead Jr./
Supervisory Patent Examiner, Art
Unit 2813

Ex. Mitchell
February 21, 2008
/James M. Mitchell/
Examiner, Art Unit 2813

